

REMARKS

The above amendments and these remarks are in response to the final Office Action dated July 15, 2004. Claims 1-52 were pending in the application prior to the outstanding Office Action. In the final Office Action, the Examiner rejected claims 1-52. The present response amends claims 1, 2, 6, 7, 9, 10, 14, 15, 17-23, 26-38, 42, 43 and 45-52, leaving for the Examiner's consideration claims 1-52.

Entry of these Amendments are respectfully requested, either to put the case in condition for Allowance, or to put this case in better condition for Appeal.

Additionally, reconsideration of the rejections is requested.

I. Discussion of Amendments

Applicant respectfully requests that the Examiner enter the Amendments to claims 1, 2, 6, 7, 9, 10, 14, 15, 17-23, 26-38, 42, 43, 45 and 47-51 in order to make explicit, that which Applicant thought was already implicitly claimed. More specifically, Applicant would like to amend claims 1, 2, 6, 7, 9, 10, 14, 15, 17-23, 26-38, 42, 43, 45 and 47-51 to make it clear that the claimed "second electrode" is "hollow". By originally stating, e.g., in claim 1, that "said second electrode is formed to have a leading nose and two side walls with ends to the side walls bent back to substantially meet each other," Applicant had thought it was already clear that the claimed second electrode was hollow. However, in Section 6 of the final Office Action, the Examiner stated that "the claim language does not include an electrode that is not solid inside." Accordingly, Applicant would presently like to amend claims 1, 2, 6, 7, 9, 10, 14, 15, 17-23, 26-38, 42, 43, 45 and 47-51 to make it clear that the claimed second electrode is "hollow". These amendments are clearly supported by the specification (e.g., see FIGS. 11A-11F). Also, these amendments should not require a new search since it appears that the Examiner was already examining these claims as if the second electrode were hollow. Applicant respectfully request that these Amendments be entered to put this case in condition for Allowance, or at least to put this case in better condition for Appeal.

Minor amendments were also made to claims 46 and 52 to make them more clear. These amendments clearly do not add new matter, and clearly do not require that the Examiner perform a new search. Accordingly, Applicant respectfully requests that these Amendments also be

entered to put this case in condition for Allowance, or at least to put this case in better condition for Appeal.

II. Discussion of Rejections under 35 U.S.C. 103(a)

As was the case in the first Office Action (of October 10, 2003), in the final Office Action claims 1- 52 were again rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Lee* (U.S. Patent No. 4,789,801). Claims 1-52 were also again rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Sakakibara et al.* (U.S. Patent No. 4,643,745).

Exemplary Claim 1, as amended, includes a hollow second electrode "wherein said hollow second electrode is formed to have a leading nose and two side walls with ends to the side walls bent back to substantially meet each other."

In Sections 4 and 5 of the final Office Action, the Examiner again admitted that neither *Lee* nor *Sakakibar* teach these features. However, it was again asserted in the final Office Action that "it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that specific configurations of the electrodes would have been an obvious matter of design choice." Additionally, it is also again asserted in the final Office Action that since the second solid electrodes in *Lee* and *Sakakibar* are also collector electrodes, they would work equally well whether they are solid or having an annular space in the center ... because the collector electrodes collect ion particles on the surface." It was further asserted that "specific configurations of the electrodes would have been determined by routine experimentation in order to achieve maximal benefits attendant therewith."

III. The Examiner has failed to Establish a *Prima Facie* Case of Obviousness

Applicant respectfully asserts that the Examiner has failed to establish a *prima facie* case of obviousness. As explained in MPEP 2143.03, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art."

The Examiner has repeatedly admitted that the applied prior art references do not teach two side walls "with ends to the side walls bent back to substantially meet each other." Nevertheless, without providing any support or rationale, the Examiner has asserted that "it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that specific configurations of the electrodes would have been an obvious matter of design

choice" and that "specific configurations of the electrodes would have been determined by routine experimentation in order to achieve maximal benefits attendant therewith."

Applicants respectfully disagree that the claimed configuration of the hollow second electrode would have been an obvious matter of design choice. The Examiner has cited no case law or MPEP section that states that the Examiner's general assertion is sufficient to establish a *prima facie* case of obviousness. Further, the Examiner has not pointed to any suggestion or motivation in the prior art to produce the claimed invention.

As pointed out by the Federal Circuit in *In re Fritch*, "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992). If the Examiner is to maintain this rejection, Applicant respectfully requests that the Examiner point out where the prior art suggests providing a hollow second electrode that is "formed to have a leading nose and two side walls with ends to the side walls bent back to substantially meet each other."

As mentioned above, the Examiner has also stated that the solid electrodes in Lee and Sakakibar would work equally well whether they are solid or have an annular space in the center ... because the collector electrodes collect ion particles on the surface. Whether or not this is true, Applicant does not see how this is relevant to patentability of the claimed invention. Nevertheless, as pointed out in Applicant's Reply to the first Office Action, and as pointed out below, there are many advantages of the present invention over Lee and Sakakibara.

III.A. Advantages of the Present Invention

In the first Office Action (of October 10, 2003) it was asserted that Applicants did not provide any advantages for electrodes having this particular configuration over other configurations. In the Response (of January 6, 2004) to the first Office Action, Applicants explained why the claimed second electrode has advantages over a solid collector electrode (as in Lee and Sakakibar) and has advantages over a hollow "U" shaped electrode, e.g., as shown in FIGS. 4A and 4B of the present application.

More specifically, as previously explained, the claimed hollow second electrode is less expensive to produce than a solid electrode having the same outer dimensions (i.e., the same height, thickness, and depth). Further, a hollow second electrode as claimed will weigh less than

a solid electrode having the same dimensions. A lighter second electrode results in an overall lighter system (which is easier to maneuver and less expensive to ship), as well as making the second electrode easier to remove (for those embodiments, where the second electrode is removable from the housing, e.g., as in claims 21-23 and 26-33).

Additionally, a hollow second electrode as claimed reduces or eliminates unwanted eddy currents typically generated by a hollow "U" shaped electrode (e.g., as shown in FIGS. 4A and 4B). Such eddy currents could create a "backdraft" or reverse airflow, which slows down the airflow rate in desired forward direction (e.g., from an inlet to an outlet). Further, a hollow second electrode as claimed provides a surface that is easier and safer to clean, as compared to a "U" shaped hollow electrode with two sharp trailing ends (e.g., as shown in FIGS. 4A and 4B).

III.B. Applicant's Invention is Not an Obvious Design Choice

In Section 6 of the final Office Action, the Examiner has acknowledged that Applicant has set forth many advantages of the claimed electrode configuration. However, the Examiner again stated that "a specific configuration of an electrode would have been a matter of design choice, determined by experimentation in order to bring forth maximal benefits attendant within." For at least the following reasons, Applicant respectfully asserts that bending the edges of the sidewalls back to substantially meet each other is **not** an obvious design choice, determined by experimentation in order to bring forth maximal benefits attendant within.

First of all, the prior art cited by the Examiner does not teach or suggest making a lighter and/or less expensive collector electrode. Thus, there is no motivation in the prior art cited by the Examiner to even make a hollow collector electrode.

Second, even if the cited prior art did suggest making a lighter and/or less expensive collector electrode (which the cited prior art does not), the cited prior art certainly does not teach or suggest making the claimed hollow second electrode that has "a leading nose and two side walls with ends to the side walls bent back to substantially meet each other." As mentioned above, one possible hollow collector electrode configuration is the simple "U" shaped electrode shown in FIGS. 4A and 4B of the present application. However, Applicant discovered that this type of electrode may produce unwanted eddy currents and sharp edges. To overcome these disadvantages, Applicant developed the claimed hollow second electrode, which is more complex and more difficult to make than the simple "U" shaped electrode shown in FIGS. 4A

and 4B. Applicant believes that an electrode that is more complex and more difficult to produce is **not** a mere design choice. Rather, Applicant believes that the claimed hollow second electrode that has "a leading nose and two side walls with ends to the side walls bent back to substantially meet each other" is a significant patentable improvement in the art.

Further, Applicant asserts that the claimed invention would **not** have been determined by experimentation in order to bring forth maximal benefits attendant within. As explained in MPEP Section 2144.05.II.B., which discusses *In re Antonie*, a particular parameter must first be recognizable as a result-effective variable (i.e., a variable which achieves a recognized result) before determination of the optimum variable can be characterized as routine experimentation. 559 F.2d 618, 195 USPQ 6 (CCPA 1977). In the present case, the cited prior art does not even suggest using a hollow collector electrode. Further, the cited art does not suggest what features of a hollow collector electrode could be adjusted in order to reduce eddy currents and/or to make the collector electrode easier and safer to clean. Further, the prior art does not even suggest that eddy currents may be a problem, or that easy and safe cleaning is desirable. Accordingly, there is nothing in the cited prior art that would motivate one of ordinary skill in the art to experiment with different hollow collector electrode shapes. Further, there is nothing in the cited prior art thought would motivate one of ordinary skill in the art to attempt to overcome the problems that the present Applicant had discovered and effectively overcome.

In summary, Applicant believes that the Examiner did not establish a *prima facie* case of obviousness. Further, even if the Examiner did establish a *prima facie* case (which she respectfully has not), for at least the reasons discussed above, Applicant believes that a *prima facie* case has been overcome.

IV. Brief Discussion of Remaining Claims

Claims 2-8, 18, 21, 24, 26, 29, 32 and 35 depend from and add additional features to independent claim 1. Applicant asserts that these claims are patentable for at least the reasons discussed above with regards to claim 1, as well as the features that they add. For example, claim 3 specifically requires that "the side walls have outer surfaces, and the outer surfaces of each of the side walls are bent back adjacent to the ends of the side walls so that the outer surfaces of the side walls are adjacent to each other." Claim 4 specifically requires that "the side walls have outer surfaces, and the outer surfaces of each of the side walls are bent back adjacent

to the ends of the side walls so that the outer surfaces of the side walls face each other." Claim 5 specifically requires that "the side walls have outer surfaces, and the outer surfaces of each of the side walls are bent back adjacent to the ends of the side walls so that the outer surfaces of the side walls touch to each other." There is nothing in the cited references that teach or suggest any of these features. Further, there is nothing in the cited prior art that would motivate one of ordinary skill in the art to try to produce an electrode that includes these features.

Independent claim 9, as amended, includes the feature "wherein said hollow second electrode is formed to have two side walls with ends to the side walls bent back to substantially meet each other in order to form a smooth trailing edge on said second electrode." For at least the reasons discussed above with regards to claim 1 and its dependent claims, Applicant asserts that claim 9, and its dependent claims 10-16, 19, 22, 25, 27, 30, 33 and 36, are also patentable over the applied reference.

Independent claim 17, as amended, includes the features "wherein said hollow second electrode is formed to have two side walls with ends to the side walls bent back to substantially meet the other side wall in order to form a smooth trailing edge on said second electrode." Claims 20, 23, 28, 31, 34 and 37-44 depend from and add additional features to independent claim 17. Applicants assert that these claims are patentable for at least the reasons discussed above with regards to claim 1 and its dependent claims.

Independent claim 45, as amended, includes the features "a hollow second electrode, located downstream of said first electrode, having a nose and two trailing sides extending downstream, towards said outlet, from said nose; said trailing sides include an end section that is formed inward, back towards said nose, such that substantially no gap exists between said trailing sides." Claims 46-50 depend from and add additional features to independent claim 45. Applicants assert that claims 45-50 are patentable for similar reasons to those discussed above discussed above with regards to claim 1 and its dependent claims.

Independent claim 51, as amended, includes the features "a hollow second electrode, located downstream of said first electrode, having a nose and two trailing sides extending downstream, towards said outlet, from said nose; said trailing sides include an end section that is formed by bending said trailing sides inward and back towards said nose, such that said end sections are adjacent to each other and within said trailing sides of said second electrode." Claim 52 depends from and adds additional features to independent claim 51. Applicants assert that

claims 51 and 52 are patentable for similar reasons discussed above with regards to claim 1 and its dependent claims.

VI. Conclusion

In light of the above, it is respectfully requested that all outstanding rejections and objections be reconsidered and withdrawn. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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